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TECHNICAL REPORT

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

GRANT NO. AFOSR-88-0258

INTERNATIONAL NEURAL NETWORK SOCIETY

Submitted by
Dr. Harold Szu
Treasurer/INNS

INNS

First Annual Meeting

September 6-10, 1988

Special Supplement Issue

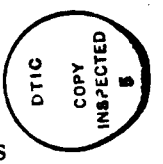
of

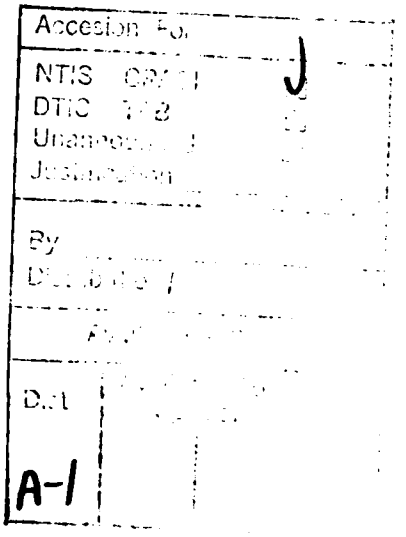
Neural Networks

Advance Program

contains

General Information
Daily Schedule Summaries
Detailed Daily Schedules
Abstracts of Papers
Index to First Authors of Papers





Boston Park Plaza Hotel
Boston, Massachusetts

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INNS First Annual Meeting

The 1988 First Annual Meeting of the International Neural Network Society (INNS) brings together over 2,000 academic scientists, engineers, students, government administrators, industrial commercializers, and financiers in an open forum for the advancement of the full spectrum of significant neural network research and development, from biology through technology.

Formed in 1987 in response to the extraordinary international interest in neural network research, INNS includes among its founders many of the most distinguished leaders of the field. By Spring, 1988, INNS membership had grown to over 2,000 of the field's most active researchers, from 34 countries and 47 states in the United States. These are the people who will determine the future of this strategic technology.

The INNS invites all those interested in the exciting and rapidly expanding field of neural networks to attend its 1988 Annual Meeting. The meeting includes plenary lectures, symposia, contributed oral and poster presentations, tutorials, commercial and publishing exhibits, government agency presentations, and social events.

Join us in Boston September 6-10, 1988!

INNS Annual Meeting
Program Committee

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Dr. Michael Cohen,
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Mr. Claude Cruz,
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Dr. Max S. Cynader,
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Harvard University
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Dr. Paul Mueller,
University of Pennsylvania
Dr. Gregory Murphy,
Brown University
Dr. Lance Optican,
National Institutes of Health
Dr. David Parker,
Menlo Park, CA
Dr. Demetri Psaltis,
California Institute of Technology
Dr. Adam Reeves,
Northeastern University
Dr. Thomas Ryan,
SAIC
Dr. Jay Sage,
MIT Lincoln Laboratory
Dr. Eric Schwartz,
New York University
Dr. Allen Selverston,
University of California, San Diego
Dr. George Sperling,
New York University
Dr. David Stork,
Clark University
Dr. Harold Szu,
Naval Research Laboratories
Dr. David Tank,
AT&T Bell Laboratories
Dr. Wilfrid Veldkamp,
MIT Lincoln Laboratory
Dr. William Warren,
Brown University
Dr. Bernard Widrow,
Stanford University
Dr. George Works,
SAIC

Plenary and Invited Speakers by Session

Plenary Speakers

Tuesday, September 6
Bernard Widrow, Meeting Chairman
Stanford University

Wednesday, September 7
Stephen Grossberg, INNS President
Boston University
Nobuo Suga
Washington University

Thursday, September 8
Carver Mead
California Institute of Technology
Terrence Sejnowski
Johns-Hopkins University

Invited Speakers

Pattern Recognition Session
Eric Schwartz
New York University
Kunihiko Fukushima
NHK Laboratories
Teuvo Kohonen
Helsinki University of Technology
Gail Carpenter
Northeastern University

Network Analysis Session
Christoph von der Malsburg
Max Planck Institut fur Biophysik-Chemie
Daniel Amit
Hebrew University
Bart Kosko
University of Southern California
Lee Giles
Air Force Office of Scientific Research

Cognition and Learning Session
James Anderson
Brown University
Geoffrey Hinton
University of Toronto
David Rumelhart
Stanford University
Walter Freeman
University of California, Berkeley

Neurobiology Session
Guenter Gross
North Texas State University
Gary Lynch
University of California, Irvine
Allen Selverston
University of California, San Diego
Max Cynader
University of British Columbia

Sensory-Motor Control and Robotics Session
Jacob Barhen
Jet Propulsion Laboratory
James Houk
Northwestern University
Lance Optican
National Institute of Health
Daniel Bullock
Boston University
Scott Kelso
Florida Atlantic University

Implementations: Optical and VLSI Session
Demetri Psaltis
California Institute of Technology
Dana Anderson
University of Colorado
Bernard Soffer
Hughes Research Laboratories
Harold Szu
Naval Research Laboratories
Jay Sage
MIT, Lincoln Laboratory

Applications Session
Michael Buffa
Nestor, Inc.
Wilfrid Veldkamp
MIT, Lincoln Laboratory
Thomas Ryan
SAIC
Robert Hecht-Nielsen
Hecht-Nielsen Neurocomputer Corp.

Vision Session
John Daugman
Harvard University
Steven Zucker
McGill University
George Sperling
New York University
Ennio Mingolla
Boston University

Grants

The International Neural Network Society
gratefully acknowledges
conference grants
provided to the INNS First Annual Meeting
by the

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listed below.
These grants have provided
crucial support
during this formative year of the Society,
and have also enabled
the INNS to provide
tr..vel grants for students and young researchers
who will be presenting papers at this meeting.

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National Science Foundation
Oak Ridge National Laboratory
Office of Naval Research

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in the arrangements for this First Annual Meeting of the INNS,
as well as the interest and support provided
by the many

Neural Network Researchers

within Hughes.

Cooperating Societies

The societies listed below have generously agreed
to cooperate with the INNS in this meeting.

American Mathematical Society
Association for Behavior Analysis
Cognitive Science Society
IEEE Computer Society
IEEE Control Systems Society
IEEE Engineering in Medicine and Biology Society
IEEE Systems, Man and Cybernetics Society
Optical Society of America
Society for Industrial and Applied Mathematics
Society for Mathematical Biology
Society of Photo-Optical Instrumentation Engineers
Society for the Experimental Analysis of Behavior

Organizing Committee for Cooperating Societies:

The following people were instrumental
in organizing the cooperation of these societies:

Mark Kon *(Chairman)*
Joseph Bronzino
William Freedman
Morris Hirsch
William Hutchinson
Simon Levin
Daniel Levine
Herbert Rauch
David Rumelhart
Jay Sage
Bernard Soffer
Harold Szu

Daily Schedule Summaries

for the

First Annual Meeting

of the

International Neural Network Society

The following pages contain daily summaries
of the activities at this meeting.

Detailed Daily Schedule

for the

First Annual Meeting

of the

Interr ational Neural Network Society

The following pages contain detailed daily schedules
of the activities at this meeting.

A Day of Tutorials
Imperial Ballroom
Tuesday, September 6, 1988

Vision and Image Processing ..... 8:00 AM
John Daugman
Harvard University

Speech and Language Proce. .ng ..... 9:00 AM
Teuvo Kohonen
Helsinki University of Technology

Break ..... **10:00 AM to 10:30 AM**

Sensory-Motor Control and Robotics ..... 10:30 AM
Stephen Grossberg
Boston University

Pattern Recognition, Associative Learning and Self-Organization ..... 11:30 AM
Gail A. Carpenter
Northeastern University

Lunch Break ..... **12:30 PM to 1:30 PM**

Cognitive Psychology for Information Processing ..... 1:30 PM
David Rumelhart
Stanford University

Local Circuit Neurobiology ..... 2:30 PM
Allen Selverston
University of California, San Diego

Break ..... **3:30 PM to 4:00 PM**

Non-Linear Dynamics for Neural Networks ..... 4:00 PM
Morris Hirsch
University of California, Berkeley

Applications, Combinatorial Optimization and Implementations ..... 5:00 PM
Demetri Psaltis
California Institute of Technology

Reception and Plenary Session
Georgian Room / Imperial Ballroom
Tuesday, September 6, 1988
Evening

Opening Welcome Reception, Georgian Room ..... **6:00 PM to 7:30 PM**
(Hors d'ouevres will be served; cash bar available. All meeting registrants are welcome.)

Plenary Session, Imperial Ballroom ..... **7:30 PM to 9:30 PM**

Official Opening of the First Annual Meeting of the INNS ..... 7:30 PM
Stephen Grossberg, President of INNS
Boston University

Learning Systems and Their Applications ..... 8:00 PM
Bernard Widrow
Stanford University

Pattern Recognition Session
Imperial Ballroom
Wednesday, September 7, 1988
Morning

Title To Be Announced ..... 8:00 AM
Schwartz, Eric
New York University

Analysis of the Process of Visual Pattern Recognition by the Neocognitron ..... 8:30 AM
Fukushima, Kunihiko
NHK Science and Technical Research Laboratories

Problems in Practical Pattern Recognition ..... 9:00 AM
Kohonen, T.
Helsinki University of Technology

Neural Network Modules for Adaptive Resonance Theory (ART) Architecture ..... 9:30 AM
Carpenter, Gail A.
Northeastern University and Boston University

A Neural Network Model for Sequential Tasks ..... 10:00 AM
Gallant, Stephen I.
Northeastern University

State Recurrence Learning ..... 10:20 AM
Rosen, B.E., Goodwin, J.M. and Vidal, J. J.
University of California, Los Angeles

Learning Decision Trees Using Parallel Sequential Induction Network ..... 10:40 AM
Sun G.Z.; Chen, H.H. and Lee, Y.C.
University of Maryland

Comparing Neural Networks and Data Analysis ..... 11:00 AM
Gallianari, P.; Thiria, S. and Soulie, F. Fogelman
Universite de Paris

Statistical Pattern Recognition with Neural Networks ..... 11:20 AM
Barna, G.; Chrisley, R. and Kohonen, T.
Helsinki University of Techology

Pattern Recognition as Minimization, A New Feedback Technique ..... 11:40 AM
Brady, M. *; Nguven, H.*; Raghavan, R.* and Slawny, J.**
Lockheed R & DD and Virginia Polytechnic Institute***

On Comparing Neural Net Training Paradigms via Graded Pattern Recognition Tasks 12:00 PM
Lendaris, George G.
Portland State University

A Relaxation Model for Pattern Classification and Association ..... 12:20 PM
Sayeh, M.R. and Pourboghrat, F.
Southern Illinois University

Lunch Break ..... ***12:40 PM to 2:00 PM***

Network Analysis Session
Georgian Room
Wednesday, September 7, 1988
Morning

Object Recognition in Dynamical Network Architecture ..... 8:00 AM
von der Malsburg, C.
Max Planck Institut fur Biophysik-Chemie

Title To Be Announced ..... 8:30 AM
Amit, Daniel
Hebrew University

Title To Be Announced ..... 9:00 AM
Kosko, Bart
University of Southern California

Computational Advantages of Higher Order Neural Networks ..... 9:30 AM
Giles, C.L.
Bolling AFB
Griffin, R.D. and Maxwell, T.
Naval Research Laboratory

Terminal Attractors in Neural Networks ..... 10:00 AM
Zak, Michail
California Institute of Technology

Input-Output Characteristics for a Class of Laterally Inhibited Graded Neural Network ..... 10:20 AM
Lemmon, Michael and Kumar, B.V.K. Vijaya
Carnegie Mellen University

A Convergence Theorem for the Modified Delta Rule ..... 10:40 AM
Sethares, W.A.
University of Wisconsin

Selforganization and Information Processing of Neural Networks ..... 11:00 AM
Babloyantz, A.; Destexhe, A. and Sepulchre, J.A.
Universite Libre de Bruxelles

Design Method for Lateral Inhibition Networks That Is Provably Stable in the Presence of Circuit Parasitics ..... 11:20 AM
Standley, D., and Wyatt, J.L. Jr
Massachusetts Institute of Technology

Gensep: A Multiple Neural Network Learning System with Modifiable Network Topology ..... 11:40 AM
Reilly, Douglas L.; Scofield, C.; Cooper, L.N. and Elbaum, C
Nestor, Inc.

Generalization in Digital Functions ..... 12:00 PM
Huyser, Karen A. and Horowitz, Mark A.
Stanford University

Interacting Neural Populations ..... 12:20 PM
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Drexel University

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Pattern Recognition Session
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Wednesday, September 7, 1988
Afternoon

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Constraints on Generalization by Adaptive Networks ..... 2:20 PM
Pavel, M.; Jimison, H and Moore, Rebecca
Stanford University

Generic Contour Features in Neural Network Pattern Rocognition ..... 2:40 PM
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State University of New York

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Wright-Patterson Air Force Base

An Analysis of Competing Neural Network Knowledge Representation Strategies ..... 3:20 PM
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**University of Houston and* ***Louisiana State University*

A Study of Scaling and Generalization in Neural Networks ..... 3:40 PM
Ahmad, S. and Tesauro, G.
University of Illinois at Urbana-Champaign

Neural Nets as Piecewise Linear Classifiers: New Algorithms ..... 4:00 PM
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Carnegie Mellon University

Neural Networks as Classifiers of Noisy Patterns: An Experimental Comparison with Bayesian Classifiers ..... 4:20 PM
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Environmental Research Institute of Michigan

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New York University

Break ..... ***5:00 PM to 5:20 PM***

Network Analysis Session
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Wednesday, September 7, 1988
Afternoon

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MIT AI Laboratory

The Stability of Sustained Oscillations in Symmetric Cooperative-Competitive Neural Networks: A Disproof of A Conjecture About Content Addressable Memory .... 2:20 PM
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IBM France
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Wednesday, September 7, 1988
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Judith Dayhoff & Associates, Inc.

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Clarkson University

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*Teledyne Brown Engineering***

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University of Hawaii

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Afternoon

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University of California, Berkeley

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Poster Session
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University of Pittsburgh

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Receptive Field Density of Y Cells Estimated by a Model of Human Retina
Inui, Toshio
ATR Auditory and Visual Perception Res. Labs
Miyake, S. and Kani, K.
Shiga University of Medical Science, Otsu, Japan

Neural Network Formation in an Aggregate of Dissociate Hydra Cells
Itayama, T.
*Tohoku University***
Koizumi, O* and Sawada, Y **
*Fukuoka Womens College**

Concept of Neuro-Automata: 2
Kadri, Rachid
Houston, TX

Sub-Neural Learning Networks
Koruga, D.L.
University of Belgrade

The Metastable and Unstable States in the Brain
Kryukov, V.
USSR Academy of Sciences

Rule-Based Growth of FFT Butterfly Networks
McKee, George
Northeastern University

Network Model of Ocular Domonance Column Formation: Analytical Results
Miller, K.D.
UCSF
Keller, J.B. and Stryker, M.P.
Stanford University

A Local Circuit Simulation Tool
Pfeiffer, H.D. and Fields, C.A.
New Mexico State University

Stochastic Connectivity in the Retinal Ganglion Cell Receptive Field: A Discrete Spatial Model
Sandini, G. and Tistarelli, M.
University of Genoa

An External Network Model of the Hippocampal Formation
Sclabassi, R.J.; Krieger, D.; Solomon, J.; Levitan, S.; Barrioneuvo G. and Berger,T.
University of Pittsburgh

Neurobiology
Poster Session
Stanbro Room
Wednesday, September 7, 1988
Afternoon (continued)

Movement Rela'ed Modulation of Sensory Transmission in Many Neuron Ensembles Recorded Simultaneously in Somatosensory Cortex and Thalamus: Dynamic Changes in Functional Connectivity

Shin, H-C. and Chapin, J.K.
Hahnemann University

Molecular Correlates of Neural Network Mediating Touch Sensitivity in Caenorhabditis Elegans

Siddiqui, Shahid S.
Toyohashi University of Technology

Correlation of Multiple Neuronal Spike Trains Using the Back-Propagation Error Correction Algorithm

Tam, D.C.; Perkel, D.H. and Tucker, W.S.
University of California, Irvine

Neural Principles of Associative Learning: Reconstruction of Ionic Currents in the Hermissenda Type B Photoreceptor

Usui, Shiro
*Toyohashi University of Technology**
Ikeno, H; Sakakibara, M* and Alkon, Daniel L.**
*Lab of MCNB,NINCDS,NIH***

Neural Network Models of an Escape Response

Wheeler, B.C. and Smith, S.R.
University of Illinois

Combinatorial Optimization
Poster Session
Park Plaza Castle
Wednesday, September 7, 1988
Afternoon

An Unified Computational Framework for Neural Network Models
Anderson, James R.
University of Texas at Austin

The Complexity of Reliability and Constraint Satisfaction In Neural Networks
Berman, P.; Parberry, I. and Schnitger, G.
The Pennsylvania State University

Microcanonical Annealing on Neural Networks
Cattaneo, G. and Cesa-Bianchi, N.
Universita di Milano

Sigmoidic Linear and Non-Linear Optimization Algorithms
Culioli, J.-C. and Protopopescu, V.
Oak Ridge National Laboratory

Scaling Techniques for Neural Algorithms
Cuykendall, Robert and Reese, Roy
University of Iowa

Computing All Invariant States of A Neural Network
De Moor, Bart; Vandenberghe, Lieven and Vandewalle, Joos
Katholieke Universiteit Leuven

Scalability Issues in Neural Networks
Fogaca, Marcelo
*MIT AI Lab**
Kramer, Alan** and Moore, Barbara *
*UC Berkeley***

Constraint Optimization Neural Network for Adaptive Early Vision
Furman, B.
UCLA
Liang,J.* and Szu, H.**
Eastman Kodak and Naval Research Labs***

Dynamical Neural Schema for Quadratic Discrete Optimizations Problems
Goles, E.; Hernandez, G. and Matamala, M.
University de Chile

On Learning Through Competition
Heath, David
Cornell University
Diegert, Carl
Sandia National Laboratories

The Importance of Being Synchronous in Neural Networks
Kamgar-Parsi, Behzad and Kamgar-Parsi, Behrooz
University of Maryland

Simultaneous Fitting of Several Curves to Point Sets Using Neural Networks
Kamgar-Parsi, Behzad
*University of Maryland***
Kamgar-Parsi**, Behrooz; Gualtieri**, J.A. and Devaney, J.E.*
*NASA Goddard Space Flight Center**

Combinatorial Optimization
Poster Session
Park Plaza Castle
Wednesday, September 7, 1988
Afternoon (continued)

Neural Computing Approach to Number Theory Problem
Marudarajan, Anaikuppam R.
California State Polytechnic University
Szu, Harold
Naval Research Laboratory

Global Combinatorial Optimization by Neural Networks
Noetzel, Andrew
Polytechnic University
Graziano, Michael J.
Covidea

Recursive Auto-Associative Memory
Pollack, Jordan B.
New Mexico State University

A Learning Rule for Neural Networks with an Application to an Optimization Problem
Sayegh, Samir
Indiana-Purdue University
Tenorio, Manoel F.
Purdue University

Stochastic Approximation Algorithm With Function Smoothing vs Simulated Annealing
Styblinski, M.A. and Tang, T.-S.
Texas A & M University

Redundant Coding for Fault Tolerant Computing on Hopfield Network
Tanaka, Hideo
*Tokyo Electric Power Company**
Matsuda, S.*; Ogi, H.*; Izui, Y.**; Taoka N.**; Sakaguchi, T.**
*Mitsubishi Electric Corporation***

A Neural Network for the Optimization of Communications Network Design
Vichniac , G.; Lepp, M. (Gardner) and Steenstrup, M.
BBN Communications Corporation

A Neural Network Algorithm for the Target-Weapon-Assignment Problem
Wacholder, E.; Han, J. and Mann, R.C.
Oak Ridge National Laboratory

A Case Study of Solving Optimization Problems Using Neural Networks
Xu, X.; Tsai, W.T. and Huang, N.K.
University of Minnesota

Dynamic Tunneling Algorithm and Simulatted Annealing Circuit for Global Optimization.
Yao, Yong
University of California at Berkeley

Plenary Session
Imperial Ballroom
Wednesday, September 7, 1988
Evening

Plenary Session, Imperial Ballroom ..... **5:30 PM to 7:30 PM**

Presidential Address ..... 5:30 PM
Stephen Grossberg, President of INNS
Boston University

Neural Computation for Auditory Imaging ..... 6:30 PM
Nobuo Suga
Washington University

Cognition and Learning Session
Imperial Ballroom
Thursday, September 9, 1988
Morning

Programming Neural Networks ..... 8:00 AM
Anderson, James A.; Markman, A.B.; Viscuso, S.R. and Wisniewski, E.J.
Brown University

Title To Be Announced ..... 8:30 AM
Hinton, Geoffrey
University of Toronto

Learning and Generalization in Brain-Style Computation ..... 9:00 AM
Rumelhart, David
Stanford University

Neurodynamics of Pattern Recognition in Biological Neural Networks ..... 9:30 AM
Freeman, W.J.
University of California, Berkeley

Back-Propagation is Significantly Faster if the Expected Value of the Source Unit is Used for Update ..... 10:00 AM
Samad, Tariq
Honeywell CSDD

Learning Algorithms for Neural Networks with Ternary Weights ..... 10:20 AM
Chiueh, T.D.; Goodman, R.M.
California Institute of Technology

Learning Contiguity with Layered Neural Networks ..... 10:40 AM
Solla, Sara A.
AT&T Bell Laboratories

Shaping Schedules as a Method for Accelerated Learning ..... 11:00 AM
Wieland, Alexis P. and Leighton, Russell
The MITRE Corporation

A Composite Holographic Associative Recall Model (Charm) and Recognition Failure of Recallable Events ..... 11:20 AM
Metcalfe, Janet
University of California, San Diego

Speedy Alternatives to Back Propagation ..... 11:40 AM
Moody, John and Darken, Chris
Yale University

Using Curvature Information to Improve Back-Propagation ..... 12:00 PM
Cun, Yann Le
University of Toronto

Representation Properties of Multilayer Feedforward Networks ..... 12:20 PM
Moore, B. and Poggio, T.
MIT AI Laboratory

Lunch Break ..... *12:40 PM to 2:00 PM*

Neurobiology Session
Georgian Room
Thursday, September 8, 1988
Morning

Multilectrode Burst Pattern Feature Extraction from Mammalian Networks in Culture ..... 8:00 AM
Gross, G.W.
University of North Texas
Hightower, M.H. and Kowalski, J.*
University of North Texas, Univ. of Texas, Arlington

Title To Be Announced ..... 8:30 AM
Lynch, Gary
University of California, Irvine

Computational Data Bases from the Lobster Stomatogastric and Other Small Neural Networks ..... 9:00 AM
Selverston, Allen
University of California, San Diego

Some Design Features of Visual Cortex ..... 9:30 AM
Cynader, Max S.
University of British Columbia

Computer-Aided Research Into A Natural Neural Network ..... 10:00 AM
Ross, M.D.; Meyer, G.**; Lam, T.**; Or, W.**; and Cutler, L.*
NASA Ames Research Center, and Sterling Software***

Specificity of Synaptic Connections in the Cerebral Cortex ..... 10:20 AM
Keller, A. and White, E. I.
Ben Gurion University

Pacemakers and Cell Assemblies ..... 10:40 AM
Bremner, F.J. and Yost, M.
Trinity University

Temporal Correlation of Multiple Neuronal Spike Trains Using the Back-Propagation Error Correction Algorithm ..... 11:00 AM
Tam, D.C.; Perkel, D.H. and Tucker, W.S.
University of California, Irvine

Models of Simulation of Real Neural Networks ..... 11:20 AM
Hartline, David K.
University of Hawaii

Tactile Information Processing: A Back-Propagation Model of Pattern Recognition in the Human Somatosensory System ..... 11:40 AM
Grajski, Kamil A.
Coleman Labs

High-Speed Imaging of Electrical Activity: Watching the Brain Think On MTV/2 ..... 12:00 PM
Nash, P.L.; Muljadi, P.; Wayner, M.J. and Senseman, D. M.
University of Texas at San Antonio

Network Model of Ocular Dominance Column Formation: Computational Results ..... 12:20 PM
Miller, K.D.
UCSF
Stryker, M.P. and Keller, J.B.
Stanford University

Lunch Break ..... ***12:40 PM to 2:00 PM***

Cognition and Learning Session
Imperial Ballroom
Thursday, September 9, 1988
Afternoon

Neurobiology Session
Georgian Room
Thursday, September 8, 1988
Afternoon

Population Coding of Two-Dimensional Saccades in the Brain Stem ..... 2:00 PM
Fujita, Masahiko
Nagasaki Institute of Applied Science

Formal Analysis of Aggregate Function of Layer II Cerebral Cortex ..... 2:20 PM
Granger, Richard; Ambros-Ingerson, Jose and Lynch, Gary
University of California, Irvine

Nonlinear Dynamical Modeling of Speech Using Neural Networks ..... 2:40 PM
Tishby, Naftali
AT&T Bell Labs

A Neural Model of the Mechanisms Underlying Infant Perception of Voice-Onset Time ..... 3:00 PM
Pont, M.J.
University of Southampton (England)

Break ..... ***3:20 PM to 3:40 PM***

Speech Session
Georgian Room
Thursday, September 8, 1988
Afternoon

Learning Vector Quantization ..... 3:40 PM
Kohonen, T.
Helsinki University of Technology

A Link Between Markov Models and Multilayer Perceptrons ..... 4:00 PM
Bourlard, H. and Wellekens, C.J.
Philips Research Laboratory (Belgium)

Hiertalker: A Default Hierachy of High Order Neural Networks That Learns to Read English Aloud ..... 4:20 PM
An, Z.G.; Mniszewski, S.M.; Lee, Y.C.; Papcun, G. and Doolen, G.D.
Los Alamos National Laboratory

Phoneme Recognition with a Neural Network: Comparisons of Acoustic Representations Including Those Produced by an Auditory Model ..... 4:40 PM
Treurniet, W.C.
Communications Research Centre
Hunt, M.J;* Lefebvre, C.* and Jacobson, Z.**
National Research Council of Canada, Carleton University***

Speech
Poster Session
Stanbro Room
Thursday, September 8, 1988
Morning

Effects of Network Topology on Speech Categorization
Anderson, Sven; Merrill, John and Port, Robert
Indiana University

Towards A Connectionist Model of Italian Morphology
Arbitrio, Alessandro
Istituto Psicologia CNR & AI Lab Selenia Roma, Italy
Delogu, Cristina
Fondazione Ugo Bordoni Roma, Italy

A Sticky-Bit Approach for Learning to Represent State
Bachrach, Jonathan R.
University of Massachusetts

Automatic Detection of Speech Properties by the Use of Neural Networks and Human Auditory System Model
Bengio, Yoshua; Cosi, Piero and DeMori, Renato
McGill University

Dynamical Networks for Speech Development
Byrne, W. and Shamma, S.
University of Maryland

Neural Models for Temporal Encoding of Information by the Auditory Periphery and for Temporal Processing in the Anteroventral Cochlear Nucleus of Cat
Carney, L.H.
University of Wisconsin-Madison

Noun Compound Understanding Using Neural Networks
Charny, M.
The MITRE Corporation

Speech Separation with Artificial Neural Networks
Chien, D.; Featherstone, M; Min, K. and Rogers, C.
East Texas State University

Neural Network as Generalized Transversal Filters
Chung, Min I.
AT&T Bell Laboratories

Non-Linear Extension of the McGill-Goldberg Counting Model
Hellman, William S.
Boston University
Hellman, R.P.
Northeastern University

Random Field and Tonotopy: Simulation of an Auditory Neural Network
Herve, T. and Demongeot, J.
Institut de la Communication Parlee, I.N.P.G.

Phonetic Discrimination Experiments with a Spatiotemporal Recognition Network
Hudak, Michael J.
Siemens Corporate Research and Support, Inc

A Learning Mechanism for the Identification of Hidden Structures in Signal Sets
Intrator, Nathan and Seebach, Bradley S.
Brown University

Speech
Poster Session
Stanbro Room
Thursday, September 8, 1988
Morning (continued)

Vowel-Feature Extraction from Cochlear Vibration Using Neural Networks
Irino T. and Kawahara, H.
NTT Basic Research Laboratories

Learning to Read Aloud
Joglekar, Umesh Dwarkanath
NASA Ames Research Center

Experiments for Isolated-Word Recognition with Single-And Multi-Layer Perceptrons
Kammerer B. and Kupper, W.
Siemens AG

Abilities and Limitations of a Neural Network Model for Spoken Word Recognitio
Kurogi, Shurichi
Kyushu Institute of Technology

A PDP Approach to Deterministic Natural Language Parsing
Kwasny, Stan C.
Washington University

A Neural Network Approach to Speech Recognition
Lee, Y.C.; Chen, H.H. and Sun, G.Z.
University of Maryland

Representation, Time, Scale, and Neural Computation
Malloch, Mike
University of Edinburgh

Computation of Temporal Pattern Primitives in a Neural Net for Speech Recognition
Mueller, Paul
University of Pennsylvania

A High Confidence Voice Interactive Hybrid Neural System for Learning
Murdock, Jane Y.
University of New Orleans
Abolrous, Sam A.; Liang, Enju and Husseiny, Abdo A.
Technology International Incorporated

Analysis of a Neural Network Algorithm for Vector Quantization of Speech Parameters
Naylor, J. and Li, K.P.
ITT Defense Communications Division

Speaker Recognition Using Kohonen's Self-Organizing Feature Map Algorithm
Naylor, J.; Higgins, A.; Li, K.P. and Schmoldt, D.
ITT Defense Communications Division

One Trial Learning of Stimulus Sequences in a Connectionist Network
Nolfi Stefano
Fondazione Sigma Tau
Parisi, Domenico
Instituto di Psicologia C.N.R., Roma

Decision Rules for Perception of Species-Specific Syllables in Song Sparrows and Swamp Sparrows
Okanoya, Kazuo and Dooling, Robert J.
University of Maryland

Speech
Poster Session
Stanbro Room
Thursday, September 8, 1988
Morning (continued)

Auditory Filter Simulations for Perceptual Processes of Bird Vocalizations
Okanoya, Kazuo and Dooling, Robert
University of Maryland

Temporal Information Processing: Word Recognition
Priebe, Carey
NOSC

Dynamics of Gestural Blending During Speech Production
Saltzman, E.; Goldstein, L.; Browman, C. and Rubin,P.
Haskins Laboratories

Temporal Knowledge: Recognition and Learning of Time-Based Patterns
Sung, Chen-Han
San Diego State University
Carey Priebe and David Marchette
Naval Ocean Systems Center

Natural Language Understanding, Propositional Representations and the Parrot System
Sutcliffe, Richard F.E.
University of Essex

Nettalk as a Simulation of Human Speech Development
Tom, M. Daniel; Schwartz, Richard G. and Tenoria, M . Fernando
Purdue University

A Connectionist Model of Children's Comprehension and Production of Simple English Sentences
Wheatley, Barbara
University of Wisconsin-Milwaukee

Lateral Inhibition and Relative Phase Shifts in the Spatio-Temporal Firing Patterns of the Auditory Nerve: A Modelling Study
Wu, Z.L.; Escudier, P. and Schwartz, J.L.
Institut de la Communication Parlee

An Error Tolerant Environment of Multilayer Perceptrons with Controlled Learning
Yu, Wellington C.P. and Teh, Hoon-Heng
University of Singapore

Self–Organization
Poster Session
Park Plaza Castle
Thursday, September 8, 1988
Morning

Self Organization as a Special Case of Time-Varying Adaptive Filters
Abutaleb, Ahmed
Temple University

Temporal Evolution of a Causal Network Through Conceptual Clustering
Ahuja, S.B. and Soh, W-Y
University of Maryland

Interacting and Communicating Connectionist Agents
Allen, Robert B.
Bell Communications Research
Riecken, Mark E.
BDM Corp.

A Neural Unsupervised Learning Technique
Atiya, Amir F.
California Institute of Technology

Variation and Selection: An Evolutionary Model of Learning in Neural Networks
Bergman, Aviv
SRI International

Printed Character Recognition by Self-Organizing Boolean Networks
Carnevali, P.
IBM European Center
Paternello, S.; De Castro, M.; Raspollini, C.; Vascotto, M. and Tonelli, T.
IBM Scientific Centers (European or Roma)

Neural Network Adaptation Using a Pleasure/Pain Paradigm
Cheung, J.Y.
University of Oklahoma

Transformational Theory of Feedforward Neural Networks
Cohen, D.A.; Mannion, C. and Shawe-Taylor, J.S.
Royal Holloway and Bedford New College

Self-Organization in Distributed Operating System
Fujita, Shohei
Stanford University

Exploratory Routines Can Direct Learning in Partially Known Non-Linear Systems
Guez, A. and Eilbert, J.L.
Drexel University

The SymMetric Adaptive Resonance Theoretic Model (SMART)
Kam, Moshe; Naim, Ari and Atteson, Kevin
Drexel University

Cluster Decomposition of Probability Density Functions
Luttrell, S.P.
Royal Signals and Radar Establishment

Adaptive Density Estimators
Marchette, David
Naval Ocean Systems Center

Self–Organization
Poster Session
Park Plaza Castle
Thursday, September 8, 1988
Morning (continued)

Activity Changes in Boolean Networks
Martland, D.
Brunel University

Spatially Traversed Autogenerative Nodal Model (ANM)
Monaco, Frank A.
Ansoldo S.P.A.

ART I and Pattern Clustering Algorithms
Moore, Barbara
MIT AI Lab

A Network of Two Drive-Reinforcement Neurons That Learns A Solution To A Realtime Dynamic Control Problem
Morgan, James S.; Patterson, Elizabeth C. and Klopf, A. Harry
Wright-Patterson Air Force Basse

A Classificatory Network Based on a Study of the Neocortex
Renfrew, CR
Strathclyde University
Malone, JR and Todd, A.
Glasgow University

Learning as Natural Selection in a Sensori-Motor Being
Rinkus, Rod
Adelphi University

Unsupervised Learning in the N-Dimensional Coulomb Network
Scofield, Christopher L.
Nestor Incorporated

Pattern Driven Message Passing Architectures for Neural Networks
Simmes, S.
Science Applications International Corporation

Attention in a Neural Network Sornborger
Andrew, T.
Creative Intelligence & Company

A Bicameral Neural Network That Improves Convergence
Stinson, M.C. and Kak, S.C.
Louisiana State University

Learning with Recurrent Networks and Constant Synaptic Strengths
Stolorz, P. and Hoffman, G.W.
University of British Columbia

Nested Neural Circuits, Multi-Level Memory and Learning by Selection
Sutton, J.P. and Trainor, L.E.H.
University of Toronto

Implementing Competitive Learning Using Competitive Activation
Sutton, III G.G. ; Maisog, J.M. and Reggia, J.A.
University of Maryland

Associative Machines and Self-Organization
Voorhees, Burton
Athabasca University

Pattern Recognition
Poster Session
Stanbro Room
Thursday, September 8, 1988
Afternoon

Network Learning Modifications for Multi-Modal Classification Problems
Atlas, L.E.; Marks, R.J. II and Taylor, J.W.
University of Washington

Hybrid Neural Networks
Austin, James
University of York (England)

A Network for Recognition and Classification of Continuous Patterns
Banzhaf, W. and Haken, H.
University of Stuttgart

Competing Network Models and Problem-Solving
Blackwood, D.; Elsberry, W. and Leven, S.
University of Texas at Arlington

A Parallel Associative Pattern Recognizer
Braham, Rafik
Georgia Institute of Technology

Pattern Recognition and Fault Tolerance in Non-Linear Neural Networks
Brause, R.
J.-W. Goethe University

Spectral Clustering with Neural Networks for Application to Multispectral Remote Sensing of Minerals
Breitkopf, Peter and Walker, Robert
FMC Corporation

Self-Organization of Invariant Recognition Categories for Noisy Images by an Adaptive Resonance Theory (ART) Architecture
Carpenter, Gail; Grossberg, Stephen and Mehanian, Courosh
Boston University

String Algorithms and Neural Network Processing For Improved Pattern Recognition
Carroll, T.O.
State University of New York

Comparison of Internal Processing of Different Network Paradigms
Caudill, Maureen
Adaptics
Butler, Charles
BDM Corporation

Two-Dimensional Pattern Sequence Prediction Using High-Order Neural Networks
Collins, David H.
California Institute of Technology

Temporal Structure in Pulse-Superposed Neural Networks
Dayhoff, Judith E.
Judith Dayhoff & Associates, Inc.,

On Hopfield Neural Networks
Feild, Jr., William B.; Navlakha, Jainendra K.
Florida International University

Pattern Recognition
Poster Session
Stanbro Room
Thursday, September 8, 1988
Afternoon (continued)

Certainty Worlds, Risk Judgments, and Neural Net Design
Hertz D.B.; Lee, E; Lynch, J.D.
University of Miami (Florida)

Composite Patterns
Horn, D.
Tel Aviv University

A Neural Network Model of Two-Point Discrimination
John, Kuruvilla
University of Illinois at Chicago
John, Thomas
BP America Research and Development

Structural Matching Using Neural Networks
Leung, C.H.
University of Hong Kong

Integration of Neural Network and Expert System for Pattern Recognition
Li, Dapeng and Wee, William G.
University of Cincinnati

Prognostics/Diagnostics of Mechanical Equipment by Neural Network
Liang, Enju; Rodriguez, Rodriguez J. and Husseiny, Abdo A.
Technology International Incorporated

Design of Neural Networks to Classify Sonar Targets
Liou, Cheng-Yuan
National Taiwan University

Digital Neural Networks — A Distributed Architecture with Self-Evolving Capabilities
Masih, L. ; Stonham, T. J.
Brunel University, Uxbridge

Vector Quantization with Optimized Grouping and Parallel Distributed Processing
Matsuyama, Y.
Ibaraki University

A Backpropagation Network Error Correcting Decoder for Convolutional and Block Codes
Means, R.W. and Caid, B.
M/A-COM Government Systems

Pattern Oriented Expert Systems
Morales, G. and McIntyre, R.
University of Texas at El Paso

A New LMS-Based Algorithm for Rapid Adaptive Classification in Dynamic Environments: Theory and Preliminary Results.
Nguyen, Dziem and Lee, James S. J.
Boeing Electronic High Tech Center

The Functional Link Net: A Unifying Network Architecture Incorporating Higher Order Effects
Pao, Yoh-Han and Beer, Randall D.
Case Western Reserve University

Pattern Recognition
Poster Session
Stanbro Room
Thursday, September 8, 1988
Afternoon (continued)

Neural Networks for Sensor Fusion and Adaptive Classification
Perlovsky, Leonid I.
Nichols Research Corporation

Invariant Object Recognition with the Adaptive Resonance (ART) Network
Rak, S.J. and Kolodzy, P.J.
Massachusetts Institute of Technology

A Neural Network Approach for Implementing Expert Systems
Ramamoorthy, P.A. and Ho, S.
University of Cincinnati

Pattern Storage and Recall Performance in a Hebb Network Generalizing the Cerebral Cortex
Rhodes, Paul
West Palm Beach, FL

Optical Character Recognition Using Multiple Layer Outer Products for Orthogonal Featu Extractions and Classifications
Scheff, Kim
Clark University
Szu, Harold
Naval Research Laboratory

Multilayer Preceptron Training Using Optimal Estimation
Shepanski, J.F.
TRW, Inc.

A Neural Network System with an Automatic Generation Mechanism for Distorted Patterns
Shimohara K.; Tokunaga, Y; Uchiyama, T. and Kimura, Y.
NTT Human Interface Laboratories

An Algorithm for Pattern Recognition with VLSI Neural Networks
Sirletti, Bruno; Verleyson, M.; Vandemeulebroecke, A. and Jespers, P.
Universite Catholique de Louvain

Understanding in Problem Solving Viewed as Minimizing of Neural Network Architecture
Surkan, A.J.
University of Nebraska

Composite Algorithms for Shaping Attraction Basins
Venkatesh, Santosh S.
*University of Pennsylvania**
Pancha, Girish* and Psaltis, Demetri**
*California Institute of Technology***

Cellular Automata and Pattern Recall: An Example
Voorhees, Burton
Athabasca University

Distributed Associated Memories and Data Fusion
Wechsler, H. and Zimmerman, L.
University of Minnesota

The Capacity of k-Gridgraphs as Associative Memory
Werman, Michael
University of Minnesota

Analysis of Network Dynamics
Poster Session
Park Plaza Castle
Thursday, September 8, 1988
Afternoon

Chaotic Relaxation in Concurrent Asynchronous Neural Networks
Barhen, Jacob
California Institute of Technology
Gulati, Sandeep and Iyengar, S. Sitharma
Louisiana State University

Relaxation Constants in Neural Nets: Theoretical Results
Barnard, E. and Casasent, D.
Carnegie Mellon University

Bounds on Capacity of Multi-Threshold Network
Bentov, I. and Huang, N.K.
University of Minnesota

A Data Flow Analysis of Connectionist Networks
Bookman, Lawrence and Zhang, X.
Brandeis University

Problem-Intrinsic Bounds on Sample Complexity
Breuel, Thomas L.
Artificial Intelligence Laboratory

Neural Network Models with Higher Order Neural Interactions
Busch, A.E. and Trainor, L.E.H.
University of Toronto

Cerebral Cortical Parallel Processing Using A Metric Tensor
Collins, III Thomas J.
KRUG International

Some Notes on the Probabilistic Semantics of Logistic Function Parameters in Neural Networks
Davies, Todd R.
SRI International

An Application-based Study of the Stochastic Parallel Computations in Harmony Theory
Fazal, Faiq Ali
AT&T Bell Laboratories

Periodic Behaviour of One and Two Dimensional Neural Networks
Goles, E.
University de Chile

Transitions Between Network States May Cause Both Equipotentiality and Localization of Function in Cerebral Cortex
Jacobson, J.Z.
Carleton University
Pullman, N.J.* and Treurnier, Wm.**
Queen's Univ. Communications Research Centre***

Adjusting to Variations in Tempo in Sequence Recognition
Kanerva, Pentti
NASA Ames Research Center

Analysis of Network Dynamics
Poster Session
Park Plaza Castle
Thursday, September 8, 1988
Afternoon (continued)

Non-Empty Box Counting Algorithm for Calculating Fractal Dimensions and Its Applications in EEG Analysis
Ling, F.H.
Shanghai Jiao Tong University
Xu, N. and Xu, J.H.
Academia Sinica, Shanghai

Stability of Neural Networks with Time Delay
Marcus, C.M. and Westervelt, R.M.
Harvard University

Analysis and Generalization of Back Propagation in Neural Networks
Musavi, M.T.; Rajavelu, A; Sahai, S; and Zhao, J.
University of Maine

Ultrametrics, Pseudo-Ultrametrics, Fuzzy Sets, and Pattern Recognition
Pearson, Ronald
E.I. DuPont de Nemours and Co., Inc.

A Survey of Network Power Spectra
Rohwer, R. and Renals, S.
Edinburgh University

Basins of Attraction and Spuriuos States in Neural Nets
Sitte, Joaquin
Queensland Institute of Technology

Open Loop Stability Criterion for Layered and Fully-Connected Neural Networks
Snyder, M.M. and Ferry, D.K.
Arizona State University

Remaking the Neural Net: A Perceptron Logic Unit
Van Alstyne, M.
MIT Lincoln Laboratory

Information Capacity of McCullough-Pitts' Model
Xu, X.; Tsai, W.T. and Huang, N.K.
University of Minnesota

A Generalized Neural Network Model
Xu, X.; Tsai, W.T. and Huang, N.K.
University of Minnesota

Plenary Session and Buffet
Imperial Ballroom /Park Plaza Castle
Thursday, September 8,1988
Evening

Plenary Session, Imperial Ballroom ..... **5:10 PM to 7:10 PM**

Real-Time Analog Computation in VLSI Neural Networks ..... 5:10 PM
Carver Mead
California Institute of Technology

The Neurobiology of Neural Networks ..... 6:10 PM
Terrence Sejnowski
Johns-Hopkins University

Exhibits and Buffet, Park Plaza Castle ..... **7:00 PM to 10:00 PM**
(A buffet will be served and a cash bar will be available.
Exhibitor booths will be open throughout the buffet.)

Sensory-Motor Control and Robotics Session
Imperial Ballroom
Friday, September 9, 1988
Morning

Neurodynamics of Redundant Manipulators ..... 8:00 AM
Barhen, Jacob
Jet Propulsion Laboratory

Model of the Cerebellum as an Array of Adjustable Pattern Generators ..... 8:30 AM
Houk, James
Northwestern University

Sensorimotor Integration of Saccadic Eye Movements ..... 9:00 AM
Optican, Lance
National Institute of Health

Neuromuscular Realization of Planned Arm Movement Trajectories ..... 9:30 AM
Bullock, D. and Grossberg, S.
Boston University

Dynamic Patterns of Sensorimotor Behavior:
Biological Control Structures and Constraints ..... 10:00 AM
Kelso, J.A.S. and Schoner, G.
Florida Atlantic University

Adaptive Control of One-Legged Hopping Machine ..... 10:30 AM
Collins, Joseph B. and Helferty, John J
Temple University

The Role of Proprioception in the Self-Optimization of the Neural
Mediating the Redundant Vestibulo-Ocular Reflex ..... 10:50 AM
Daunicht, W.J. and Werntges, H.W.
University of Dusseldorf

Topology-Conserving Maps for Motor Control ..... 11:10 AM
Ritter, Helge and Schulten, Klaus
Technical University Munich

A Neural Model for Modifiable Pattern Generation in the Scratch Reflex ..... 11:30 AM
Shadmehr, R. and Lindquist, G.D.
University of Southern California

The Role of Hidden Layers in Learning Motor Control In Autonomous Systems ..... 11:50 AM
Pabon, Jahir and Gossard, David
Massachusetts Institute of Technology

Artificial Neural Networks for Modeling Discrete Dynamic Systems ..... 12:10 PM
Levin, Esther
Technion
Gewirtzman, Raanan
IBM Israel Scientific Center

Lunch Break ..... ***12:30 PM to 2:00 PM***

Implementations: Optical and VLSI
Session
Georgian Room
Friday, September 9, 1988
Morning

Fractal Sampling Grids For Holographic Optical Interconnections ..... 8:00 AM
Psaltis, Demetri and Gu, Xiang-guang
Caltech

Optical Resonators, Learning, and Robots ..... 8:30 AM
Anderson, Dana
University of Colorado

Learning and Heteroassociation in a Hybrid Optical System ..... 9:00 AM
Soffer, Bernard
Hughes Research Laboratory

Optical Superconducting Neurocomputers ..... 9:30 AM
Szu, Harold
Naval Research Laboratory

Title To Be Announced ..... 10:00 AM
Sage, Jay
MIT Lincoln Laboratory

An Optoelectronic Connectionist Machine Utilizing Liquid Crystal Spatial Light Modulators ..... 10:30 AM
Bigner, Jack; Zhang, Lin; Cotter, Lise K. and Johnson, Kristina
University of Colorado at Boulder

Optical Implementation of Neural Network Interconnects and Learning ..... 10:50 AM
O'Callaghan, M.J. and Anderson, D.Z.
University of Colorado

Parallel Optical Processor Using Fiber Optics ..... 11:10 AM
Scheff, K.M.; Alexander, B. and Stork, D.G.
Clark University

Dynamic Holographic Interconnections for Optical Neural Computers ..... 11:30 AM
Brady, David and Psaltis, Demetri
Caltech

Application of Improved Deformable Mirror Array Technology to Neural Network Realization ..... 11:50 AM
Collins, D.R.; Sampsell, J.B.; Florence, J.M.; Penz, P.A.; Hornbeck, L.J. and Gately, M.T.
Texas Instruments, Inc.

A Simple VLSI Architecture for Neurocomputing ..... 12:10 PM
Pacheco, M.; Bavan, S; Lee, M. and Treleaven, P.
University College, London

Lunch Break ..... ***12:30 PM to 2:00 PM***

Sensory-Motor Control and Robotics Session
Imperial Ballroom
Friday, September 9, 1988
Afternoon

An Adaptive Neural Net Controller with Visual Inputs ..... 2:00 PM
Tolat, Viral V. and Widrow, Bernard
Stanford University

Building and Using Mental Models in Sensory-Motor Behavior ..... 2:20 PM
Mel, B.W.
University of Illinois at Urbana-Champaign

Neuronal Maps for Sensory-Motor Control in the Barn Owl ..... 2:40 PM
Pearson, J.C.; Spence, C.D.; Gelfand, J.J.; Sullivan, W.E.; Peterson, R.M.
Princeton University

The Neural Control of Arm and Speech Movements: A Shared Architecture for Trajectory Generation ..... 3:00 PM
Bullock, D. and Grossberg, S.
Boston University

Feedback Error Learning of Movement by Multi-Layer Neural Network ..... 3:20 PM
Kawato, Mitsuo
Osaka University
Setoyama, T.* and Suzuki, R**
Osaka University, Tokyo University***

A Parallel Distributed Architecture for Motor Control ..... 3:40 PM
Morasso, P.
University of Genoa (Italy)
Zaccaria, R.* and Mussa Ivaldi, F.A. **
*University of Genoa** Massachusetts Institute of Technology***

Control of Mobile Robots with Neural Networks ..... 4:00 PM
Nagata, S.; Kimoto, T. and Asakawa, K.
Fujitsu Laboratories Ltd.

Robotic Eye-Head-Neck Motions and Visual-Navigation Reflex Learning Using Adaptive Linear Neurons ..... 4:20 PM
Waxman, A.M.; Wong, W-L.; Goldenberg, R.; Bayle, S. and Baloch, A.
Boston University

Implementations: Optical and VLSI
Session
Georgian Room
Friday, September 9, 1988
Afternoon

An Analog VLSI Implementation of the Marr-Poggio Stereo Correspondence Algorithm ..... 2:00 PM
Mahowald, M. and Delbruck,T.
Caltech

CMOS Analog IC Implementing the Back Propagation Algorithm ..... 2:20 PM
Furman, B.; White, J. and Abidi, A.A.
University of California, Los Angeles

Integrate-and-Fire Dynamics and Spiketrain Information Coding in Neuron Equivalent Circuits Employing Silicon Diodes ..... 2:40 PM
Coon, D.D.
Microtonics Associates
Perera, A.G.U.
University of Pittsburgh

Analog "Neural" Network Integration ..... 3:00 PM
Smith, M.J.S. and Portmann, C. L.
University of Hawaii

An Interconnect Structure for Wafer Scale Neurocomputers ..... 3:20 PM
Rudnick, M. and Hammerstrom, D.
Oregon Graduate Center

A Modifiable Weight Circuit for Use in Adaptive Neuromorphic Networks ..... 3:40 PM
Shoemaker, P.A. and Shimabukuro, R.
NOSC

EEPROMs as Analog Storage Devices for Neural Nets ..... 4:00 PM
Hu, Victor; Kramer, Alan; and Ko, Prof. P.K.
U.C. Berkeley

A Large Hybrid Electro-Optic Computer for Neural Network Applications ..... 4:20 PM
Kornfeld, C.D.; Frye, R.C.; Wong,C.C. and Rietman, E.A.
AT&T Bell Laboratories

Analog MOS Circuit Techniques in the VLSI Implementation of Neural Networks ..... 4:40 PM
Satyanarayana, S.; Suyama, K. and Tsividis, Y.
Columbia University

Vision
Poster Session
Stanbro Room
Friday, September 9, 1988
Morning

Optimization of Rotationally Invariant Object Recognition In A Neural Network
Busenberg, Stavros and Rossi, Louis
Harvey Mudd College

Depth from Stereo: Variational Theory and a Hybrid Analog-Digital Network
Chhabra, Atul K. and Grogan, Timothy A.
University of Cincinnati

Multichannel Approach to Adaptive Image Restoration Using The 2-D Least Squares Algorithm
Chellali, Mohamed and Ingle, Vinay K.
Northeastern University

Integration of Stereo-Vision and Optical Flow Using Markov Random Fields
Clifford, Sandra P. and Nasrabadi, Nasser M.
Worcester Polytechnic Institute

Image Compression Within Visual System Constraints
Cottrell, G.W. and Willen, J.D.
Univ. of California, San Diego

The Visual System in "Idle": Multiple Stable States
Dev, Parvati
CEMAX, Inc.

Network Implementation of a System for Autonomous Visual Flight Control Using Optical Flow
Doner, J.; Rahman, Z.; Inigo, R; and McVey, E.
University of Virginia

An Analytical Model of Lateral Inhibition in the Visual System
Feld, D. and Parnas, B
University of California at Berkeley

Morphology of Neural Networks in the Mammalian Visual System
Gardner, Sheldon
Naval Research Laboratory

Labeling Edges with a Linear Network: An Integration of Low-Level Vision Modules
Geiger, David and Weinshall, Daphna
MIT

Perceptual Grouping Network Architecture
Gelband, Patrice and Lawton, Daryl T.
Advanced Decision Systems

VLSI Architecture for Computer Vision Based On Neurobiological Principles of Organization
Ginosar, Ran and Zeevi, Y.
Israel Institute of Technology

Spatial and Temporal Masking by Saturation in the Human Fovea
Girod, B.
MIT Media Laboratory

Vision
Poster Session
Stanbro Room
Friday, September 9, 1988
Morning (continued)

Automated Process Control Based on an Optical Fourier/Electronic Neurocomputer Inspection System
Glover, D. E.
Global Holonetics Corporation

Glass Pattern Recognition with Neural-Networks
Greenspan, H.; Fleisher, M.; Porat, M. and Zeevi, Y.Y.
Israel Institute of Technology

A Link Between Retinotopic Frame and Stable Feature Frame
Hartmann, G.
Universitat - GH-Paderborn

Development of Features for Texture Based Image Segmentation Using The Reduced Coulomb Energy Pattern Recognition Model
Heinemann, Karl G. and Menon, Murali M.
MIT Lincoln Laboratory

Networks for Learning Lightness Algorithms
Hurlbert, Anya C.
M.I.T.

Analysis of the Neocognitron's Outputs and Classification Performance Using Backpropagation
Johnson, Ken; Daniell, Cindy and Burman, Jerry
Hughes Aircraft Company

Hierarchical Feature Extraction and Representation in the Neocognitron
Johnson, Ken; Daniell, Cindy and Burman, Jerry
Hughes Aircraft

The Effects of a Probabalistic Environment on Perceptual Mechanisms
Kalish, M.
University of California, San Diego

Reflectance Estimation in the Presence of Sharp Shadows or Transparency
Kersten, Daniel and Plummer, Daniel J.
Brown University

Digital Halftoning of Images Using Feedforward Neural Networks
Kollias, S. and Anastassiou, D.
Columbia University

Adaptive Object Tracking Integrating Neural Network and Intelligent Processing
Lee, James S.J.; Nguyen, Dziem D. and Lin, C.
Boeing High Technology Center

A New Neural Network Model for Line Drawing Texture Segmentation
Li, Feng; Yao, Guozheng and Wang, Yunjui
Academia Sinica, Beijing PRC

Hierarchical Neural Network Architectures for Vision System
Lin, Jin-Kun
*North Carolina State University**
Mei,G-G.; Liu, W* and Chen, S-S.**
*University of North Carolina***

Vision
Poster Session
Stanbro Room
Friday, September 9, 1988
Morning (continued)

Feedforward Shunting: The Role of 3rd Order Correlations in Neural Synchronicity
Lopez, Luis R.
Teledyne Brown Engineering

Object Recognition Using Contextual Information
Mader, Steve
Honeywell Systems and Research Center

The Face Pattern Identification by Back-Propagation Learning Procedure
Midorikawa, H.
Seikei University

Neural Network That Computes Visual Motion
Miyamoto, K. and Yamada, H.
University of Tokyo

Short Range Motion Detection in the Insect Visual System
Ogmen, H. and Gagne, S.
Laval University

Realization of Visual Perception Via Synaptic Reinforcement
Omidvar, Omid M.
University of Science and Arts of Oklahoma

A Channel Model Makes Better Predictions of Single Lateral Geniculate Neuronal Responses than a Three-Layer Network Model Does
Optican, Lance M.; Richmond, B.J.; McClurkin, J.W. and Gawne,T.J.
NIN and NIMH, Bethesda Research

Stochastic Relaxation and Correspondence Problems in Object Recognition
Randall, A.F. and Caelli, T.M.
University of Alberta

A Neural Network Classifier for Character Recognition
Shirvaikar, M.V. and Musavi, M.T.
University of Maine

An Architecture of an Image Processing System Optimized for Neural Network
Takatori, Sunao; Kumagai, Ryohei and Yamamota, Makoto
EZEL, Inc.

A Model of the Mapping of the Surface of the Arm on the Somatosensory Cortex.
Todorovic, Dejan
Univerzitet u Beogradu

A Lie Group Approach to the Design of Neural Networks for Perception of Shape Constancy and Common Fate Gestalt
Tsao, Thomas and Kanal, Laveen N.
University of Maryland

Opponent Mechanisms in Vision
Walters, Deborah
State University of New York

A Neural Network to Register Invariants in Object-Relative Position Under Observer Locomotion
Whitehead, B.A. and Strong, G.W.
Drexel University

Vision
Poster Session
Stanbro Room
Friday, September 9, 1988
Morning (continued)

Contextual Image Segmentation with a Neural Network
Wright, W.A.
Sowerby Research Center

Neural Network for Model Based Recognition: Simulation Results
Zador, Tony; Gindi, Gene; Mjolsness, Eric; and Anandan, P.
Yale University

A Neural Network Approach to Computation of Optical Flow
Zhou, Y.T. and Chellappa, R.
University of Southern California

Neurocomputers
Poster Session
Park Plaza Castle
Friday, September 9, 1988
Morning

A Connectionist Architecture for Neural Networks
Ali, Kamal S.; Ali, Dia L. and Ali, Adel L.
University of Southern Mississippi

Perspectives on Neural Networks
Brakefield, James C.
KRUG International

Constrained Back-Propagation
Cailton, J.G.; Angeniol, B and Markade, E.
Thomson CSF Inc

Back Propagation Parameter Analysis on Multiprocessors
Cerf, G.; Mokry, R. and Weintraub, J.
Columbia University

Neural Net Hardware Performance Assessment
Cruz, C.A.
Plexus Systems

Simulation and Implementation Considerations with Classification Networks
Kolodzy, P.J. and Menon, M.M.
Massachusetts Institute of Technology Lincoln Lab

Investigation of Artificial Neural System Architectures Using Actors
Kraft, Timothy
Science Applications International Corporation

An Algebraic Projection Analysis for Back-Propagation Learning
Kung, S.Y. and Hwang, J.N.
Princeton University

Learning Implementation on a Deterministic General Purpose Neural Network
Lauria, Francesco E.
Universita' di Napoli

Analysis of Back Propagation Dynamics Using Graphical Network Representation Scheme
Lehar, S.
Textron Defense Systems

An Object-Oriented Language for Neural Network Simulation
Loe, K.F.; Hsu, L.S.; Chan, S.C. and Low, H.B.
National University of Singapore

ANSER: An Approach to Neural Network Design
Mader, Steve
Honeywell Systems and Research Center

On the Expedient Use of Neural Networks
Martinez, Tony
Brigham Young University

Molecular Electronics an Overview
Saia, Paul
Digital Equipment Corporation

A General Model of Neural and Related Networks
Seaholm, S.
Minnetonka, MN

Neurocomputers
Poster Session
Park Plaza Castle
Friday, September 9, 1988
Morning (continued)

APL Implementation of a Neural Network with Dynamically Generated Middle Layers of Arbitrary Number and Length
Surkan, A.J. and Chen, Muh-Lin
University of Nebraska

Combined Backpropagation/Cauchy Machine
Wasserman, Philip D.
Anza Research

Aspirin for Migraines
Wieland, Alexis P.; Leighton, Russell and Morgart, William
The MITRE Corporation

Parallel Processing Neural Networks
Zargham, M.
Southern Illinois University at Carbondale

Applications
Poster Session
Stanbro Room
Friday, September 9, 1988
Afternoon

Criteria for Choosing Connectionist Paradigms for Real-Time Data Fusion and Adaptive Discrimination
Addison, Edwin R.; Cain, Michael and Dedmond, William
Booz, Allen & Hamilton Inc.

Connectionist Expert Systems for Process Planning
Ali, Dia L.; Ali, Adel L. and Ali, Kamal S.
University of Southern Mississippi

Image Reconstruction by Neural Net Processor
Bai, B. and Farhat, N.H.
University of Pennsylvania

Image Resolution Enhancement on a Neural Network
Bayley, J.S.
*University of Lowell**
Byrne, C.L.*; Fiddy, M.A.*;Abbiss, J.B.** and Brames, B.J.**
*Spectron Development Laboratories***

SDI Applications of Neural Network Technology
Castelaz, Patrick F. ; Zmuda, James E. and Mills, Dwight
Hughes Aircraft Company

Efficient Distribution of Backpropagation Models on Parallel Architectures
Ceci, L.; Lynn, P., and Gardner, P.
University of Colorado

On Neural-Logic Networks
Chan, S.C.; Hsu, L.S. and Teh, H. H.
National University of Singapore

Neural Networks for Image Databases
Cochet, Y. and Paget, G.
University of Rennes (France)

Artificial Neural Systems Engineering and Analysis
Deiss, Stephen
Science Applications International Corporation

Resource Allocation Using A Constraint Optimizing Adaptive Neural Network
Earle, George W.
GTE-SEDD
Szu, Harold
Naval Research Laboratory

A Billion Connection Per Second Feedforward Pipeline for Computer Vision Applications
Fogler, R.J.; Williams, R.L. and Hostetler, L.D.
Sandia National Laboratories

Binary Neurons with Analog Communication Links for Solving Large-Scale Optimization Problems
Foo, Yoon-Pin Simon
*University of South Carolina**
Takefugi, Yoshiyasu* and Szu, Harold**
*Naval Research Laboratory***

Applications
Poster Session
Stanbro Room
Friday, September 9, 1988
Afternoon (continued)

Neural Network Machine Vision
Fox, Richard; Czerniejewski, F; Fluet, F. and Mitchell, E.
Gould, Inc.

Using Small Mulltilayer Networks to Search Real Hyperspaces
Guha, Aloke
Honeywell Corporate Systems Development Divisioon

Neural Network Identification and Extraction of Repetitive Superimposed Pulses in Noisy 1-D Signals
Hassoun, Mohamad and Spitzer, A.R.
Wayne State University

A Neural System Implemented in Fortran on a Parallel Digital Computer
Healy, Michael
Boeing Computer Services

Automatic Chemical Process Control Using Reinforcement Learning in Artificial Neural Networks
Hoskins, J.C. and Himmelblau, D.M.
University of Texas at Austin

Analysis of Dataflow Diagrams by Neural Network
Hsu, L.S.; Chan, S.C. and Teh, H.H.
National University of Singapore

Neural Nets as Models of Global Socio-Political Behavior
Kaufman, Jonathan J.
Mount Sinai School of Medicine

A Neural Network Implementation of a Page-Swapping Algorithm
Lawson, D. and Williams, B.
Stetson University

Recognition of Hand-Written Symbols by Orientation-Selective Filtering
Lee, Kangsuk
Siemens Corporate Research and Support, Inc.

Simulated Annealing Applied to Shipbuilding Design
Lee, Won D.
ChungNam National University

Application of Back Propagation to Long Wave Infra-Red Signature Analysis
Lehar, S.
Textron Defense Systems

Dynamic Schemas, Expert Systems, and A.R.T.
Leven, Sam and Yoon, Young
University of Texas at Arlington

Adaptive 2-D Tracking With Neural Networks
McAulay, A.D.
Wright State University

Three-Valued Threshold Logic and Neural Networks: Application to Reliability Analysis
Parey, C. and Bonnemay, A.
IRDI

Applications
Poster Session
Stanbro Room
Friday, September 9, 1988
Afternoon (continued)

Neural Networks & Tactile Imaging
Pati, Y.C.; Krishnaprasad, P.S.; Peckerar, M.C. and Marrian, C.R.
US Navel Research Laboratory

Neuronal Path Planning and Motion Control of Mobile Robots
Pourboghrat, F. and Sayeh, M.R.
Southern Illinois University

Signal Modeling and Prediction Using Neural Networks
Ramamoorthy, P.A.; Govind, G. and Iyer, V.K.
University of Cincinnati

Control of a Deformable Mirror Using an Adaptive Network
Ransil, P. and Siegel, K.
Lockheed AI Center

Neural Network for Radar Terrain Image Recognition
Roberts, Iris P.
The Analytic Sciences Corporation

A Rule-Based Fault-Tolerant Neurocontroller
Rodriguez, Rodrigo J.; Liang, Enju and Husseiny, A.A.
Technology International, Inc.

A Neural Network for Acquisition of Object Images
Shah, B.H. and Graves, S.J.
University of Alabama

Neural Networks for Function Discrimination in EMG Controlled FES Walking for Paraplegics
Uth, John and Graupe, Daniel
Univ. of Illinois at Chicago

Application of Neural Nets to Detection of Diabetes
Wadleigh, Frank R.
General Dynamics Corporation

An Application of a Multiple Neural Network System with Modifiable Network Topology (Gensep) to Online Character Recognition
Ward, David J.; Scofield, Christopher and Reilly, Douglas L.
Nestor Inc.

Possible Mechanism for the Symptoms of Gilles de La Tourette Syndrome: Potential Application of Neural Network Principles
Williams, P.A.
LSU School of Medicine

Nondeterministic Adaptive Automata That Play Matching Pennies
Windecker, Richard C.
AT&T Bell Laboratories

Alternative Generalizers to Neural Nets
Wolpert, D.
University of California, Santa Barbara

Applications
Poster Session
Stanbro Room
Friday, September 9, 1988
Afternoon (continued)

Neural-Like Architectures Can Implement Complex Signal Processing Algorithms
Yeates, M.C.
Jet Propulsion Laboratory

Target Recognition Using Adaptive Resonance Neural Networks
Zmuda, James E.
Hughes Aircraft Company

Applications Session
Imperial Ballroom
Saturday, September 10, 1988
Morning

Title To Be Announced ..... 8:00 AM
Buffa, Michael
Nestor, Inc.

Amacronic Sensors ..... 8:30 AM
Veldkamp, Wilfrid
MIT Lincoln Laboratory

Application of Hierarchical Networks in Analog Pattern Categorization ..... 9:00 AM
Ryan, Thomas W.
Science Applications International Corporation

Theory of the Backpropagation Neural Network ..... 9:30 AM
Hecht-Nielsen, Robert
HNC, Inc.

Spacecraft Attitude Determination Using Neural Star Pattern Recognition ..... 10:00 AM
Alvelda, P.; San Martin, M; Bell, C; and Barhen, J.
Jet Propulsion Laboratory, California Institute of Technology

Radar Signal Categorization Using a Neural Network ..... 10:20 AM
Anderson, James A.
Brown University
Penz, P.A.; Gately, M.T. and Collins, Dean
Central Research Labs, Texas Instruments

ANNA: An Adaptive Neural Network Associator for Human/Computer Interfacing ..... 10:40 AM
Jones, W.P.
Arthur D. Little, Inc.

Deconvolution Using a CMAC Neural Network ..... 11:00 AM
Glanz, F.H. and Miller, W.T.
University of New Hampshire

An Approach to Restoration and Recovery Problems Using Parallel Hierarchical Neural Networks ..... 11:20 AM
Kadar, I.
Grumman Corporation
Waner, S.; Wu, Y. and Hastings, H.M.
Hofstra University

Study of Real-Time Weld Seam Tracking Visual Image Analysis Using a Neural Network ..... 11:40 AM
Rock, A.; Xu, X.; King, K.; Jones, J. and Vanderveldt, H.
American Welding Institute

An Electrical Hardware Neural Network of an Optimization-Problem Solver ..... 12:00 PM
Yanai, H.; Hayakawa, Y. and Sawada, Y.
Tohoku University

The Mirrors/II Connectionist Simulator ..... 12:20 PM
D'Autrechy, C.L. and Reggia, J.A.
University of Maryland

Lunch Break ..... ***12:40 PM to 2:00 PM***

Vision Session
Georgian Room
Saturday, September 10, 1988
Morning

Neural Networks for Image Transformation, Analysis, and Compression ..... 8:00 AM
Daugman, John G.
Harvard University

The Organization of Curve Detection: Course Tangent Fields and Fine Spline Coverings ..... 8:30 AM
Zucker, Steven W.
McGill University

Some Principles of Neural Organization Inferred from Visual Psychophysics ..... 9:00 AM
Sperling, George
New York University

Recent Results in Emergent Visual Segmentation ..... 9:30 AM
Mingolla, Ennio
Boston University

Neural Mappings and Space-Variant Image Processing 10:00AM
Mallot, Hanspeter and von Seelen, Werner
Joh. Gutenberg Universitat

A Silicon Retina for Computing Local Edge Orientations ..... 10:20 AM
Allen, Timothy P. and Mead, Carver A.
Synaptics, Inc

Neural Mapping and Parallel Optical Flow Computation for Autonomous Navigation ..... 10:40 AM
Bulthoff, Heinrich H.*; Little, James J.* and Mallot, Hanspeter A.**
MIT, Johannes Gutenberg-Universitat***

Vector Quantization of Images Based Upon the Kohonen Self-Organization Feature Maps ..... 11:00 AM
Nasrabadi, Nasser M. and Feng, Yushu
Worcester Polytechnic Institute

Early Vision Applications of Feature-Map Diffusion-Enhancement Nets ..... 11:20 AM
Seibert, M. and Waxman, A.M.
Boston University

"Collective Coding": A Mechanism to Improve the Signal/Noise Ratio of the Retinal Ganglion Cell ..... 11:40 AM
Tsukamoto, Y.; Smith, R. and Sterling, P.
University of Pennsylvania

A Neural Network for Position Invariant Pattern Representation ..... 12:00 PM
Lange, J. and von der Malsburg, C.
University of Southern California

Dimension Reduction Models for Topographical Maps in the Cortex ..... 12:20 PM
Durbin, R. and Mitchison, G.
Kings College

Lunch Break ..... ***12:40 PM to 2:00 PM***

Applications Session
Imperial Ballroom
Saturday, September 10, 1988
Afternoon

Prediction of Mortgage Loan Performance with a Multiple Neural Network Learning System ..... 2:00 PM
Ghosh, Sushmito; Collins, Edward A. and Scofield, Christopher L.
Nestor Incorporated

Loan Underwriting by a Neural Network ..... 2:20 PM
Smith, Murray
Adaptive Decision Systems

A Neural Net Application Environment ..... 2:40 PM
Cruz, C.A.
Plexus Systems

Distributed Processing for Database Design ..... 3:00 PM
Char, J.M.; Cherkassky, V. and Wechsler, H.
University of Minnesota

Application of Neural Networks to Sorting Problems ..... 3:20 PM
Gray, D.L.; Michel, A.N. and Porod, W.
University of Notre Dame

Credit Evaluation with Missing Data Fields ..... 3:40 PM
Madey, G. and Denton, J.
Kent State University

Desknet: The Dermatology Expert System With Knowledge-Based Network ..... 4:00 PM
Yoon, Youngohc
University of Texas at Arlington
Peterson, Lynn L.* and Bergstresser, Paul R.**
University of Texas at Arlington, University of Texas SW Medical Center***

Neural Net Solvers for Differential Games ..... 4:20 PM
Bankes, Steve
The RAND Corporation

A Neural Net Approach to Discrete Fourier Transforms ..... 4:40 PM
Culhane, A. D.; Peckerar, M.C. and Marrian, C.R.K.
Naval Research Laboratory

Neurocomputers Session
Georgian Room
Saturday, September 10, 1988
Afternoon

The SAIC Neurocomputer Architecture ..... 2:00 PM
Deiss, Stephen; Hicks, W.; Kasbo, R.; Morse, K.; Muenchau, E. and Works, G.
Science Applications International Corporation

Parallel Neural Network Simulation Machine: NeuMan ..... 2:20 PM
Kajihara, Nobuki; Matsushita,Satoshi; Nakata,Toshiyuki and Koike,Nobuhiko
NEC Corporation

PFANNs: Pulse-Frequency Activated Neural Networks ..... 2:40 PM
Cater, John P.
Digital Signal Corporation

Sensory-Motor Control and Robotics
Poster Session
Stanbro Room
Saturday, September 10, 1988
Morning

A Neural Network Approaach for Robot Grasp Planning
Ali, Adel L.; Ali, Dia L. and Ali, Kamal S.
University of Southern Mississippi

Skin & Muscles: The Basic Wet-Ware for Sensory-Motor Control
De Rossi, D.
University of Pisa
Casalino, G.; Morasso, P.* and Mussa Ivaldi, F.A.**
University of Genoa Massachusetts Institute of Technology***

Decision Making Net for an Autonomous Roving Vehicle
Eberlein, Susan
Jet Propulsion Laboratory

Concept of A 4-Joint Machine with Neural Net Control for the Generation of 2-Dimensional Trajectories
Eckmiller, Rolf
University of Dusseldorf

The Design of an Adaptive Neural Controller for Collision-Free Movement of General Robot Manipulators
Graf, D.H. and LaLonde, W. R.
Carleton University

A Trainable Controller Based on Neural Network
Guez, Allon and Selinsky, John
Drexel University

Solution to the Inverse Kinematics Problem in Robotics by Neural Networks
Guez, Allon and Ahmad, Ziauddin
Drexel University

Neural Network Techniques Used to Create An Adaptive Spatial System for the Motor-Impaired
Hohensee, W.E.
University of Illinois

A Robot Control Strategy Using Neural Networks
Josin, G.; Charney, D. and White, D.
Neural Systems Incorporated

Gas Tungsten Arc Weld Modeling Using a Mapping Network
Karsai, G.; Ramaswamy, K. and Cook, G.E.
Vanderbilt University

Application of the Neural Network for the Trajectory Planning of a Biped Locomotive Robot
Kitamura, S.; Kurematsu Y. and Nakai, Y.
Kobe University

Real Time Learned Sensor Processing and Motor Control for a Robot with Vision
Miller,III, W.Thomas
University of New Hampshire

Sensory-Motor Control and Robotics
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Computer Simulation of the Motor-Neural System of a Simple Invertebrate
Niebur, E. and Erdos, P.
University of Lausanne

Learning Structure of the Cerebellar Cortex
Pacut, Andrzej
Oregon State University

Coordinated Trajectory Control in Intrinsic Sensorimotor Frames
Pellionisz, A.
NYU Medical Center

Maze Learning Using State-Space Search Performed by a Connectionist Network
Pinette, Brian
University of Massachusetts

Neural Network Learning Controller for Manipulators
Pourboghrat, F. and Sayeh, M.R.
Southern Illinois University

Neuromorphic Regulation of Dynamic Systems Using Back Propagation Networks
Sanner, Robert M. and Akin, David L.
MIT Space Systems Laboratory

A Self-Organizing Process for Sensory Data Fusion and Situation Analysis
Sung, Chen-Han
San Diego State University

Neural Networks for Robotic Control
Tawel, R. and Thakoor, A.P.
California Institute of Technology

Multiple Topographic Maps In Sensory Cortex and Joint Inversion
Travis, B.
Los Alamos National Laboratory

Neural Control of 3-Dimensional Truss Structure
Tsutsumi, Kazuyoshi
Kobe University

Effects of Forgetting on the Self-Optimization of Redundant Sensory-Motor Control Networks
Werntges, H.W. and Daunicht, W.J.
University of Duesseldorf

An Adaptive Network That Flees Pursuit
Winter, C.L.
Science Applications International Corporation

Game-Theoretic Interaction Among Stochastic Learning Networks for Adaptive Load Balancing
Yeung, D.Y. and Bekey, G.A.
University of Southern California

Implementations: Optical and VLSI
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A New Generic Approach for Optoelectronic Hardware Realizations of Neural Networks Models
Agranat, Aharon; Neugebauer, Charles F. and Yariv, Amnon
California Institute of Technology

Training a Limited-Interconnect, Feedforward Neural Array
Akers, L.A. and Walker, M.R.
Arizona State University

Design of a Solid Optical Interconnect for Massive Neural Networks
Brown, J.B. and Caufield, H.J.
Teledyne Brown Engineering

An Optical Neural Society of Mind
Caulfield, H. J.
University of Alabama in Huntsville

Neural Algorithms on VLSI Concurrent Architectures
Caviglia, D.D.; Bisio, G.M. and Parodi, G.
Universita' di Genova

Weight Discretization in Backward Error Propagation Neural Networks
Fiesler, E.; Choudry, A. and Caulfield, H. J.
University of Alabama in Huntsville

Progress on the Spin Chip Associative Processor
Goodwin, J.M.; Rosen, B.E. and Vidal, J.J.
University of California, Los Angeles

VLSI Implementation of Neural Networks Based on PN Sequences:
Gupta, P.K. and Kumaresan, R.
University of Rhode Island

Neural Networks, Optical Resonators, and Dynamic Holograms
Gustafson, Steven C. and Little, Gordon R.
University of Dayton Research Institute

Optical Implementation of a Shunting Subnetwork
Johnson, John L.
Redstone Arsenal

Random Code Neural Nets
Jourjine, Alexander N.
Analog Intelligence DA Corp.

Architecture for Large Microelectronic Supervised Learning Artificial Neural Networks Using a Hybrid Digital Analog Approach
Kub, F.J.
*Naval Research Laboratory***
Ancona, M. G.**; Mack I.A.**; Moon, K.** and (Yao, C.T.)*
**Sachs-Freeman Associates*

Ring Systolic Designs for Artificial Neural Nets
Kung, S.Y. and Hwang, J.N.
Princeton University

Implementations: Optical and VLSI
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Inner-Product Optical Neural Processing and Supervised Learning
Liu, Hua-Kuang
*California Institute of Technology**
Chao, T-H.; Barhen, Jacob;* and Bittner, Graf**
*University of California, San Diego***

Fault Simulation of a Wafer-Scale Integrated Neural Network
May, N.
Tektronix
Hammerstrom, D.
Oregon Graduate Center

A Test Methodology for Electronic Neural-Network Associative Memory
Mazunder, P.
University of Michigan

An Analog Implementation of a "Neural" Optimization Network
Musavi, M.T.; Ramanathan, E. and Roy, A.
University of Maine

Implementation of Optical Sensory Neural Networks by Simple Discrete and Monolithic Circuits
Nabet, Bahram and Darling, Robert B.
University of Washington

A VLSI Architecture for Feedforward Networks with Integral Back-Propagation
Paulos, John and Hollis, Paul W.
North Carolina State University

A Fully Digital Architecture for Multi-State Neural Networks
Potu, B. and Ramamoorthy, P. A.
University of Cincinnati

A VLSI Three Layer Perceptron for Binary Image Classification
Rasure, John and Salas, John
University of New Mexico

Properties of Amorphous Silicon Photoconductive Synapses
Rietman, E.A.; Frye, R.C.; Wong, C.C. and Kornfeld, C.D.
AT&T Bell Laboratories

A Hypercube Compact Neural Network
Rostykus, P.L. and Somani, A.K.
University of Washington

Optical Optimization Processor Based on Binary Neurons and Analog Interconnects
Scheff, Kim
Clark University
Szu, Harold
Naval Research Laboratory

A Real-Time Interface Model for Neural Architectures
Signorini, Jacqueline
Universite Paris

Abstracts of Papers

(organized by session, and alphabetized by first author within the session)